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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)

6050.005.001

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on _____

Signature _____

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name _____

Application Number

10/591,215

Filed

08/30/2006

First Named Inventor

Thomas J. Adamo

Art Unit

2622

Examiner

Gabriel, Selam T.

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

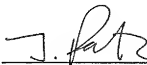
The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/95)☒ attorney or agent of record.
Registration number 58,167☐ attorney or agent acting under 37 CFR 1.34.

Registration number if acting under 37 CFR 1.34 _____



Signature

Tuvia Rotberg

Typed or printed name

212-486-7272

Telephone number

01/18/2011

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required.
Submit multiple forms if more than one signature is required, see below*.☒ *Total of 1 forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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|-----------------------|--------------------------|
| In re application of: | Adamo |
| Serial No.: | 10/591,215 |
| Filed: | 08/30/2006 |
| Group Art Unit: | 2622 |
| Examiner: | Gebriel, Selam T |
| For: | Apparatus for Imaging... |
| Docket No. | 6050.005.001 |

January 18, 2011

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sir:

Of the 23 pending Claims, the following is a excerpt from the only independent Claim in the above-referenced Application:

1. A nano-imaging apparatus comprising multiple optical elements of sub-micron, nanometer scale having more than one pixel per optical element...

In an Advisory Action mailed on November 4, 2010, Claims 1-23 have been finally rejected under 35 USC 103 as being obvious over Tangen in view of Hoshuyama.

In the Advisory Action, the Examiner maintained his position that Tangen discloses a "nano-imaging apparatus...comprising multiple optical elements of sub-micron..." (see e.g. Advisory Action of 11/04/2010, par. 4). The Examiner has taken the position that Applicant's invention is, essentially, a micro-camera scaled down to nano-scale dimensions and that it would be obvious to down-scale a camera as such. In response, Applicants have asserted that the difference between nano-scale and micro-scale is not merely a difference in size/scale (see e.g. Applicants' Remarks of 08/27/2009 pg. 8). Rather, using "multiple optical elements of sub-micron, nanometer scale having more than one pixel per optical element..." the invention set forth in Claim 1 is able to manipulate light in the nano-domain — a property not taught or suggested in the

prior art. That is, "optical elements of *sub-micron*, nanometer scale," are on a sub-wavelength scale (i.e. less than 400-600 nm for visible light). In this "nano-domain", the wave behavior is not the same as the classic wave optics relied upon in the Tangen and Hoshuyama references.

Applicants have argued, repeatedly, that neither Tangen nor Hoshuyama teach or suggest the limitation of nanoscale. (see e.g. Applicants' Remarks of 10/18/2010, pg. 6 (last par) - pg. 7; Remarks of 06/14/2010 pg. 6; Remarks of 08/27/2009 pg. 9 (top)). The Examiner made his first substantive response to Applicants' arguments in the above-mentioned Advisory Action (par. 3). The Examiner disagreed with Applicants because "the word nanoscale is not defined to be anything but a camera of 10^{-9} scale. Tangen discloses a micro camera; a micro camera can be a camera of 0.001×10^{-9} scales which is a nanoscale."¹

Applicant maintains that the Examiner's position that Tangen teaches "a nano-imaging apparatus comprising sub-micron..." is clearly erroneous.

Tangen does not Teach or Suggest a Nanoscale Imaging Apparatus comprising Sub-Micron [Optical Elements]

It is respectfully submitted that the use of "micro" lenses is as described in Tangen is well known in the prior art. In fact, the current publication (US 2007/0182821) states that "On top of the light sensitive device sometimes a micro lens is placed in order to harvest..." (Par. 16). Such use of micro lenses

¹ Applicant respectfully disagrees with the Examiner's position. It is common knowledge that the term "nano" describes a prefix being equal to 10^{-9} and micro being another prefix equal to 10^{-6} . Most often, these prefixes are associated with units of length, as in micrometer, nanometer etc. But the word nano is nowadays also used in another context, the context of nanoscience and nanotechnology or going nano- meaning that by reducing size to the nanoscale, new phenomena may be possible to employ in order to make more efficient devices etc. One example is nano-scaled surfaces that give rise to surfaces having lower friction than micron-scaled surfaces, a phenomena being explored in e.g. advanced professional swim wear (mimicking the skin of a shark). Hence, the word nano is nowadays a generic word put in front of something else, explicitly meaning that the "something else" is utilizing nanoscale phenomena (being taught in quantum physics, in contrast to standard macro-scale regime). Hence, a nanocamera is not only a small micro-camera since the "optics and physics" being processed in the nano-camera is different from its counterpart in the micro-camera. This would seemingly be incontrovertible. Applicant is unsure as to how the Examiner concluded that micro-scale is a nanoscale?

does not teach or suggest "optical elements of sub-micron, nanometer scale." The Tangen reference discloses that it is possible to overcome diffraction limitations in micro-cameras using arrays of microlenslets. The Tangen reference, as such, operates using classic wave optics (Newtonian principles) – and it does not teach or suggest "sub-micron" optical elements as set forth in Claim 1.

Furthermore, the Examiner has stated on numerous occasions (see e.g. Advisory Action pg. 3, line 13) that "it would have been obvious to one ordinary skilled in the art...to reduce the *micro-camera of Tangen to nano level as taught by Hoshuyama*." (emphasis added). By this statement the Examiner has conceded that Tangen does *not* teach a "nano level."

The Examiner has further taken the position that Hoshuyama teaches "a nano-imaging apparatus comprising optical elements in a nanometer scale having more than one pixel per optical element." Furthermore, the Examiner stated that "it would have been obvious...to reduce the micro-camera of Tangen to nano level as taught by Hoshuyama (see e.g. Advisory Action pg. 3, line 13).

Applicant maintains that the Examiner's 35 USC 103 rejection based on the combined teachings of Tangen and Hoshuyama is clearly erroneous in view of the following: 1) Hoshuyama does not teach or suggest "nano level." 2) Hoshuyama does not teach or suggest the limitation of "more than one pixel per optical element." 3) It would not be obvious to combine the cited references. 4) The combination of the cited references *does not yield the invention set forth in Claim 1*.

Hoshuyama does not Teach or Suggest Optical Elements of Nanoscale

As described (see e.g. Remarks of 06/14/2010 pg. 7 par. 2-5), Hoshuyama teaches a system for enhancing color light utilization in cameras by

separating the primary colors via dichroic mirrors. Simply put, Hoshuyama describes *a device that is inserted between a conventional lens and the sensors*. The dichroic mirrors increase photon utilization efficiency and reduce false color that is sometimes introduced as a result of color interpolation. Applicant emphasizes that the invention disclosed by Hoshuyama does nothing to the size of the camera. Hoshuyama's improvement lies in the fact that more information is gleaned from a signal than would be acquired in prior cameras. However, there is nothing in the Hoshuyama reference that teaches, suggests or even alludes to reducing the camera size at all – and certainly not to *nanoscale*.

The Hoshuyama reference, as such, describes enhanced signal capture to be utilized in *ordinary cameras*. Applicant is unsure, and the Examiner has not explained how Hoshuyama teaches a "nano-imaging apparatus comprising optical elements in a nanometer scale..."

Hoshuyama does not Teach or Suggest an Optical Element...Having More Than One Pixel Per Optical Element

The Examiner further stated that Hoshuyama teaches "optical elements in nanometer scale having more than one pixel per optical element." Applicant respectfully disagrees with the Examiner's assertion.

Hoshuyama describes improving the well-known Bayer Array (see col. 1, line 50) by adding dichroic mirrors as described above. The improvement described by Hoshuyama lies in the fact that the inventive arrangement gathers more information than other cameras using the well-known Bayer Array. However, Hoshuyama, does not by any means teach or suggest a device that has more than one pixel per optical element. Rather, the light entering through the optical element described by Hoshuyama *contributes to one pixel* – and not to "more than one" as set forth in Claim 1. (see Remarks of 11/04/10 pgs 7-8).

It Would Not be Obvious To Combine Tangen and Hoshuyama

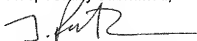
Please see the portion of Applicants' Remarks of 10/18/2010, pg. 8 under the above sub-heading.

The Combination of Tangen and Hoshuyama would not Result in the Invention set forth in the instant Claims

Applicant submits that even if one of ordinary skill in the art would try to combine the Tangen and Hoshuyama references – *doing so would not yield the invention set forth in Claim 1*. That is because it would be technically and physically impossible to combine the teachings of Tangen and Hoshuyama. In order for Hoshuyama to resolve three different colors from one signal, at least three dichroic mirrors - set at 45-degree angles are necessary in order to transfer the light to all of the light receiving surfaces. The amount of space required for this arrangement would not be feasible in nano (or even micro) sized cameras. Thus, even if one were to combine the cited references – one would not achieve the invention set forth in Claim 1. That is, the space necessitated by Hoshuyama's dichroic mirrors make it impossible and, in fact, teach away from a nano or even micro-sized device. (Remarks of 10/18/2010, pg. 9).

In view of the above, Applicant believes that the Examiner's 35 U.S.C. 103 rejection based on Tangen and Hoshuyama are clearly erroneous and the same should be reversed.

Respectfully submitted,



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